

AMENDMENT TO THE CLAIMS

The following claim set replaces all prior versions, and listings, of claims in the application:

1-20 (Cancelled)

21. (Previously Presented) A method of treating chemical cellulose pulp from an alkaline pulping process, after cooking and preferably after oxygen delignification, with chlorine dioxide in a first chlorine dioxide stage of an elemental chlorine free bleaching sequence, and of minimizing the use of chlorine dioxide, consisting of the sequential steps:

- (a) bleaching the chemical cellulose pulp in a first chlorine dioxide step at a temperature between 80-100°C for less than 10 minutes and so as to provide a chlorine dioxide dosage of between 0.5-1.5 % active chlorine, and adjusting the pH of the pulp in the first chlorine dioxide step so that the final pH of the step is over 4;
- (b) effecting an acid treatment of the chemical cellulose pulp from step (a) at a pH of between 2 – 5 and at a temperature of over 80°C and a time of 30-300 minutes sufficient to remove hexenuronic acids from the pulp, and
- (c) bleaching the chemical cellulose pulp from step (b) in a second chlorine dioxide step.

22. (Previously Submitted) A method as recited in claim 21 wherein (a) is practiced so that the final pH of the first chlorine dioxide step is over 5, and so that hexenuronic acid groups in the pulp substantially do not react with chlorine dioxide.

23 -24. (Canceled)

25. (Previously Presented) A method as recited in claim 22 wherein step (a) is further practiced so that the treatment time in the first chlorine dioxide step is between 30 seconds - 3 minutes.

26. (Cancelled)

27. (Previously Submitted) A method as recited in claim 21 wherein (a)-(c) are practiced so that the treatment temperatures in the first chlorine dioxide step, the acid treating step, and the second chlorine dioxide step, are substantially the same.

28. (Previously Submitted) A method as recited in claim 21 wherein (c) is practiced so as to provide a chlorine dioxide dosage of between about 0.5-2.0% active chlorine during the practice of the second chlorine dioxide step.

29. (Previously Presented) A method as recited in claim 21 further consisting of treating the chemical cellulose pulp with a chelating agent after (a) and (b).

30 - 31. (Canceled)

32. (Previously Submitted) A method as recited in claim 21 wherein (a) is further practiced so that the treatment time in the first chlorine dioxide step is between 30 seconds - 3 minutes, and at a chlorine dioxide dosage of about 0.1-1.0% active chlorine.

33. (Previously Submitted) A method as recited in claim 21 wherein step (b) is practiced at a pH between 2.5-4, a temperature between 90-110°C, and a time between 30-300 minutes.

34. (Previously Submitted) A method as recited in claim 21 wherein (a) through (c) are practiced utilizing an acid tower, an inlet line to the acid tower, and an outlet line from the acid tower to a further treatment device; and wherein (a) is practiced

substantially completely within the inlet line to the acid tower, (b) is practiced substantially completely within the acid tower, and (c) is practiced substantially completely in the discharge line from the acid tower.

35. (Currently Amended) A method of treating chemical cellulose pulp from an alkaline pulping process, after cooking and preferably after oxygen delignification, with chlorine dioxide in a first chlorine dioxide stage of an elemental chlorine free bleaching sequence, and of minimizing the use of chlorine dioxide, consisting of the sequential steps:

- (a) bleaching the chemical cellulose pulp in a first chlorine dioxide step so that the final pH of the step is over 5, and so as to provide a chlorine dioxide dosage of between about 0.5-1.5 % active chlorine and so that hexenuronic acid groups in the pulp substantially do not react with chlorine dioxide, and for a treatment time of between 30 seconds-three minutes and at a temperature of 80-100⁰C ~~4000C~~;
- (b) acid treating the chemical cellulose pulp from step (a) at a pH of between 2 - 5 and at a temperature of over 80°C for 30-300 minutes, and
- (c) bleaching the chemical cellulose pulp from step (b) in a second chlorine dioxide step.

36. (Cancelled)

37. (Previously Submitted) A method as recited in claim 35 wherein (a)-(c) are practiced so that the treatment temperatures in the first chlorine dioxide step, the acid treating step, and the second chlorine dioxide step, are substantially the same.

38. (Previously Submitted) A method as recited in claim 35 wherein (a)-(c) are practiced so that the treatment temperatures in the first chlorine dioxide step, the acid

treating step, and the second chlorine dioxide step, are substantially the same, and between about 90-100°C.

39. (Previously Presented) A method of treating chemical cellulose pulp from an alkaline pulping process, after cooking and preferably after oxygen delignification, with chlorine dioxide in a first chlorine dioxide stage of an elemental chlorine free bleaching sequence, consisting of the sequential steps:

- (a) bleaching the chemical cellulose pulp in a first chlorine dioxide step at a chlorine dioxide dosage of between about 0.1-1.0% active chlorine and at a temperature of between 80-100°C and for less than 10 minutes, and adjusting the pH of the pulp in the first chlorine dioxide step so that the final pH of the step is over 4,
- (b) acid treating the chemical cellulose pulp from step (a) at a pH of between 2 – 5 and at a temperature of over 80°C for 30-300 minutes, and
- (c) bleaching the chemical cellulose pulp from step (b) in a second chlorine dioxide step at a chlorine dioxide dosage of between about 0.5-2.0% active chlorine.

40. (Previously Submitted) A method as recited in claim 39 wherein (a) is further practiced so that the temperature in the first chlorine dioxide step is between about 80-100°C, and so that the treatment time in the first chlorine dioxide step is between 30 seconds – three minutes.

41. (Previously Submitted) a method as in claim 39, wherein step (c) is practiced for less than 10 minutes.